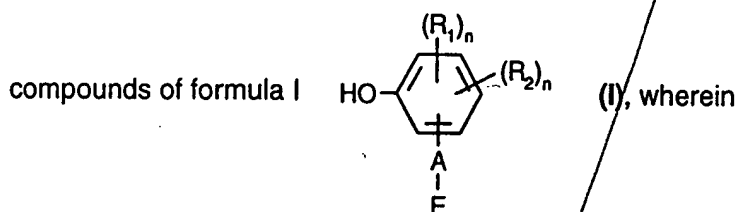


What is claimed is

1. A process for stabilising and at the same time phase compatibilising plastics or plastic compositions by incorporating polymeric compounds obtainable by reacting a compound selected from the group consisting of the sterically hindered phenols, sterically hindered amines, lactones, sulfides, phosphites, benzotriazoles, benzophenones and 2-(2-hydroxy-phenyl)-1,3,5-triazines, which compounds contain at least one reactive group, with a compatibilisator.

2. A process according to claim 1, wherein the sterically hindered phenols are



SUB B2

R_1 and R_2 are each independently of the other hydrogen, C_1 - C_{25} alkyl, phenyl- C_1 - C_3 alkyl which is unsubstituted or substituted once or several times at the aromatic ring by OH or/and C_1 - C_4 alkyl, unsubstituted or C_1 - C_4 alkyl-substituted C_5 - C_{12} cycloalkyl, or phenyl;
 n is 1, 2 or 3;

E is OH, SH, NHR_3 , SO_3H , $COOH$, $-CH=CH_2$, $-(CH_2)_m-CH-CH_2$ or $-P(=O)(OH)-R_4$;

m is 0 or 1;

R_3 is hydrogen or C_1 - C_9 alkyl;

R_4 is C_1 - C_{12} alkyl, or phenyl which is unsubstituted or substituted by one or several C_1 - C_4 -alkyl, halogen or/and C_1 - C_{18} alkoxy;

A if E is OH, SH or $-CH=CH_2$, is $-C_xH_{2x}-$, $-CH_2-S-CH_2CH_2-$, $-C_qH_{2q}-(CO)-O-C_pH_{2p}-$, $-C_qH_{2q}-(CO)-NH-C_pH_{2p}-$ or $-C_qH_{2q}-(CO)-O-C_pH_{2p}-S-C_qH_{2q}-$;


x is a number from 0 to 8;

p is a number from 2 to 8;

q is a number from 0 to 3;

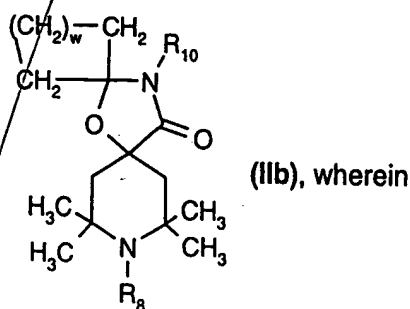
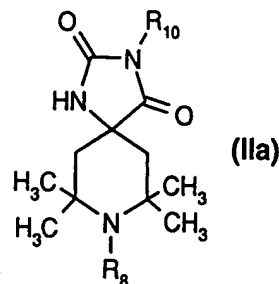
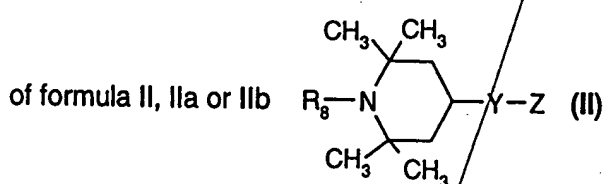
R_1 and n are as defined above; or



- A if E is -NHR_3 , is $\text{-C}_x\text{H}_{2x}\text{-}$ or $\text{-C}_q\text{H}_{2q}\text{-(CO)-NH-C}_p\text{H}_{2p}\text{-}$, wherein x, p and q have the meanings cited above; or
- A if E is COOH or SO_3H , is $\text{-C}_x\text{H}_{2x}\text{-}$, $\text{-CH}_2\text{-S-CH}_2\text{-}$ or $\text{-CH}_2\text{-S-CH}_2\text{CH}_2\text{-}$, wherein x has the meaning cited above; or

- A if E is $\text{-(CH}_2\text{)}_m\text{-CH-CH}_2\text{-}$ , is a direct bond, $\text{-C}_q\text{H}_{2q}\text{-(CO)}_m\text{-O-CH}_2\text{-}$ or $\text{-C}_x\text{H}_{2x}\text{-S-CH}_2\text{-}$, wherein q, m, x, R_1 and R_2 are as defined above;

- A if E is -P(=O)(OH)-R_4 , is $\text{-CH}_2\text{-}$.

3. A process according to claim 1, wherein the sterically hindered amines are compounds



- R_8 is hydrogen, $\text{C}_1\text{-C}_{25}$ alkyl, $\text{C}_2\text{-C}_{20}$ alkenyl, $\text{C}_2\text{-C}_{20}$ alkynyl, $\text{C}_1\text{-C}_{20}$ alkoxy, phenyl- $\text{C}_1\text{-C}_3$ alkyl, $\text{C}_5\text{-C}_{12}$ cycloalkyl, $\text{C}_5\text{-C}_8$ cycloalkoxy, phenyl, naphthyl, hydroxyethyl, $\text{CO-C}_1\text{-C}_{25}$ alkyl, CO-phenyl , CO-naphthyl , $\text{CO-phenyl-C}_1\text{-C}_3$ alkyl, $\text{O-CO-C}_1\text{-C}_{20}$ alkyl or $\text{C}_1\text{-C}_6$ alkyl-S- $\text{C}_1\text{-C}_6$ alkyl, $\text{C}_1\text{-C}_6$ alkyl-O- $\text{C}_1\text{-C}_6$ alkyl, $\text{C}_1\text{-C}_6$ alkyl-(CO)- $\text{C}_1\text{-C}_6$ alkyl, $\text{-CH}_2\text{CH}_2\text{-O-CH}_2\text{-CH-CH}_2\text{-}$  or $\text{-CH}_2\text{-CH-CH}_2\text{-}$ 

W is a number from 1 to 10;

Y is a single bond, C₁-C₂₅alkylene, phenylene, biphenylene, naphthylene,

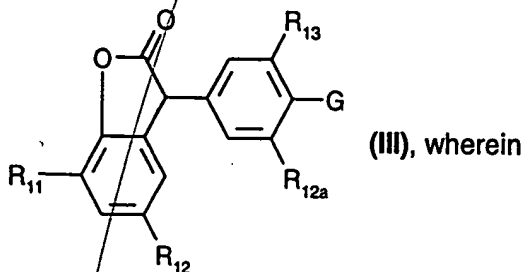
-O-C₁-C₂₅alkylene, -NR₉-, -O- or $\begin{array}{c} R_9-C=O \\ | \\ -N-C-C_{25}\text{alkylene} \end{array}$;

Z is hydrogen, -COOR₉, -NH₂, -OR₉, hydroxyethyl, $-\text{CH}_2-\overset{\text{O}}{\text{CH}}-\text{CH}_2$ or $-\overset{\text{O}}{\text{C}}(\text{R}_9)-\text{C}=\text{CH}_2$;

R₉ is hydrogen or C₁-C₁₂alkyl;

R₁₀ has the same definition as R₉.

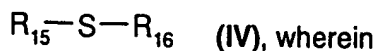
4. A process according to claim 1, wherein the lactones are compounds of formula III



R₁₁, R₁₂, R_{12a} and R₁₃ are each independently of one another hydrogen, C₁-C₂₅alkyl, phenyl-C₁-C₃alkyl, C₅-C₁₂cycloalkyl or phenyl; and

G is OH, OCH₂CH₂OH, $-\text{O}-\text{CH}_2-\overset{\text{O}}{\text{CH}}-\text{CH}_2$ or -OCH₂COOH.

5. A process according to claim 1, wherein the sulfides are compounds of formula IV



R₁₅ is C₁-C₁₈alkyl, benzyl, phenyl or $-\overset{\text{S}}{\underset{\text{||}}{\text{P}}}-(\text{OR}_{17})_2$; and

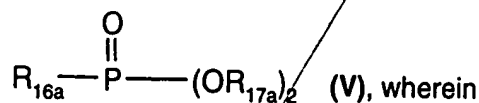
R₁₆ is -CH₂CH₂OH, $-\text{CH}_2-\overset{\text{O}}{\text{CH}}-\text{CH}_2$, -CH₂COOH or -CH₂CH₂COOH; and

R₁₇ is C₁-C₁₈alkyl or unsubstituted or C₁-C₄alkyl-substituted phenyl.

10037543-10901

SUB
B2

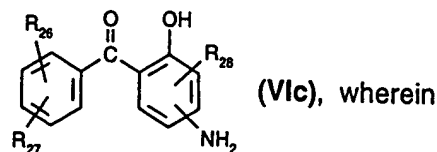
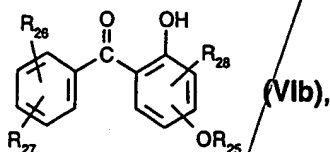
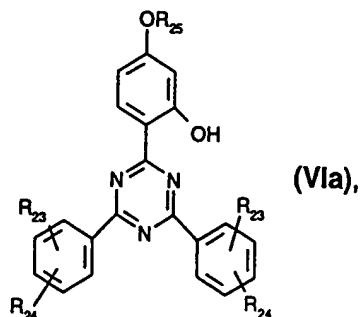
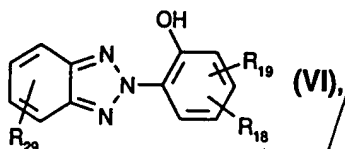
6. A process according to claim 1, wherein the phosphites are compounds of formula V



R_{16a} is $-\text{CH}_2\text{CH}_2\text{OH}$ or $-\text{CH}_2\text{CH}_2\text{COOH}$; and

R_{17a} is $\text{C}_1\text{-C}_{18}$ alkyl or unsubstituted or $\text{C}_1\text{-C}_4$ alkyl-substituted phenyl.

7. A process according to claim 1, wherein the benzotriazoles, benzophenones and 2,4,6-triaryl-1,3,5-triazines are compounds of formula VI, VIa, VIb or VIc



R_{18} is $-(\text{CH}_2)_r\text{-R}_{20}$, $-\text{O}-\text{CH}_2-\overset{\overset{O}{\parallel}}{\text{C}}-\text{CH}_2$ or NH_2 ;

R_{19} is $\text{C}_1\text{-C}_{12}$ alkyl, α,α -dimethylbenzyl or a radical $-\text{CH}_2-\text{C}(\text{CH}_3)_2-\text{CH}_2-\text{C}(\text{CH}_3)_3$;

R_{20} is $-\text{OH}$, $-\text{SH}$, $-\text{NHR}_{30}$, $-\text{SO}_3\text{H}$, $-\text{COOR}_{21}$, $-\text{CH}=\text{CH}_2$, $-(\text{CH}_2)_m-\overset{\overset{O}{\parallel}}{\text{C}}-\text{CH}_2$ or $-(\text{CO})-\text{NH}-(\text{CH}_2)_u-\text{NCO}$;

R_{21} is hydrogen, $-\text{CH}_2-\overset{\overset{O}{\parallel}}{\text{C}}-\text{CH}_2$ or $-\text{CH}_2-\text{CH}(\text{OH})-\text{CH}_2-\text{O}-(\text{CO})-\text{R}_{22}$;

R_{22} is $\text{C}_1\text{-C}_4$ alkyl or phenyl;

R_{23} and R_{24} are each independently of the other hydrogen or $\text{C}_1\text{-C}_4$ alkyl;

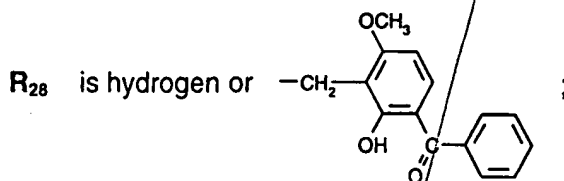
R_{25} is hydrogen, $-(\text{CH}_2)_v\text{-OH}$, $-\text{CH}_2-\overset{\overset{O}{\parallel}}{\text{C}}-\text{CH}_2$, $-(\text{CH}_2)_v\text{COOH}$ or $-(\text{CO})-\text{NH}-(\text{CH}_2)_u-\text{NCO}$;

100744-1007

SUB
B2

R₂₆ is hydrogen, OH or C₁-C₁₂alkoxy;

R₂₇ is hydrogen or OH;



R₂₉ is hydrogen or halogen;

R₃₀ is hydrogen or C₁-C₉alkyl;

m is 0 or 1;

t is a number from 0 to 6;

u is a number from 2 to 12.

8. A process according to claim 1, wherein the compatibiliser compound is a polymer containing acid groups, acid anhydride groups, ester groups, epoxy groups or alcohol groups or wherein the compatibiliser compound is a copolymer or terpolymer of polyethylene, polypropylene, vinyl acetate or styrene with acrylic acid.

9. A process according to claim 8, wherein the compatibiliser compound is a polymer with acrylic acid (AA) function, glycidyl methacrylate (GMA) function, methacrylic acid (MAA) function, maleic anhydride (MAH) function or vinyl alcohol (VA) function.

10. A process according to claim 8, wherein the compatibiliser compound is a copolymer consisting of polyethylene acrylic acid (PE-AA), polyethylene glycidyl methacrylate (PE-GMA), polyethylene methacrylic acid (PE-MAA) or polyethylene maleic anhydride (PE-MAH) or a terpolymer of polyethylene and vinyl acetate with acrylic acid or a terpolymer of polyethylene and acrylates with acrylic acid.

11. A process according to claim 8, wherein the compatibiliser compound is a grafted polyethylene or polypropylene copolymer selected from the group consisting of maleic anhydride grafted to polyethylene vinyl acetate (MAH-g-PE-vinyl acetate), maleic anhydride grafted to low density polyethylene (MAH-g-LDPE), maleic anhydride grafted to high density

1063743-10901

SUB
B2

polyethylene (MAH-g-HDPE), maleic anhydride grafted to linear low density polyethylene (MAH-g-LLDPE), acrylic acid grafted to polypropylene (AA-g-PP), glycidyl methacrylate grafted to polypropylene (GMA-g-PP), maleic anhydride grafted to polypropylene (MAH-g-PP), maleic anhydride grafted to ethylene/propylene terpolymer (MAH-g-EPDM), maleic anhydride grafted to ethylene/propylene rubber (MAH-g-EPM) and maleic anhydride grafted to polyethylene/polypropylene copolymer (MAH-g-PE/PP).

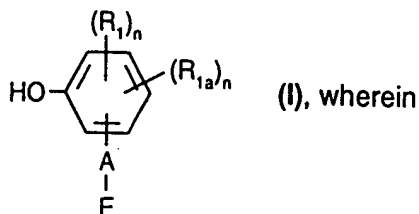
12. A process according to claim 8, wherein the compatibiliser compound is a grafted styrene co- or terpolymer selected from the group consisting of styrene/acrylonitrile grafted with maleic anhydride (SAN-g-MAH), styrene/maleic anhydride/methyl methacrylate, styrene/butadiene/styrene block copolymer grafted with maleic anhydride (SBS-g-MAH), styrene/ethylene/propylene/styrene block copolymer grafted with maleic anhydride (SEPS-g-MAH), styrene/ethylene/butadiene/styrene block copolymer grafted with maleic anhydride (SEPS-g-MAH) and acrylic acid/polyethylene/polystyrene terpolymer (AA-PE-PS-terpolymer).

13. A process according to claim 8, wherein the compatibiliser compound is a vinyl alcohol copolymer.

14. A process according to claim 1, wherein the polymers to be stabilised are at least two different polymers.

15. A process according to claim 1, wherein the polymers to be stabilised are recycled material.

16. A compound obtainable by reacting sterically hindered phenols of formula I



10037543-110904

SUB
B2

R_1 and R_2 are each independently of the other hydrogen, C_1 - C_{25} alkyl, phenyl- C_1 - C_3 alkyl which is unsubstituted or substituted once or several times at the aromatic ring by OH or/and C_1 - C_4 alkyl, unsubstituted or C_1 - C_4 alkyl-substituted C_5 - C_{12} cycloalkyl, or phenyl;
 n is 1, 2 or 3;

E is OH, SH, NHR_3 , SO_3H , $COOH$, $-CH=CH_2$, $-(CH_2)_m-\overset{\text{O}}{\text{CH}}-\text{CH}_2$ or $-\overset{\text{O}}{\underset{\text{OH}}{\text{P}}}-R_4$;

m is 0 or 1;

R_3 is hydrogen or C_1 - C_9 alkyl;

R_4 is C_1 - C_{12} alkyl, phenyl which is unsubstituted or substituted by one or several C_1 - C_4 -alkyl, halogen or/and C_1 - C_{18} alkoxy;

A if E is OH, SH or $-CH=CH_2$, is $-C_xH_{2x}-$, $-CH_2-S-CH_2CH_2-$, $-C_qH_{2q}-(CO)-O-C_pH_{2p}-$, $-C_qH_{2q}-(CO)-NH-C_pH_{2p}-$ or $-C_qH_{2q}-(CO)-O-C_pH_{2p}-S-C_qH_{2q}-$;

x is a number from 0 to 8;

p is a number from 2 to 8;

q is a number from 0 to 3;

R_1 and n are as defined above; or

A if E is $-NHR_3$, is $-C_xH_{2x}-$ or $-C_qH_{2q}-(CO)-NH-C_pH_{2p}-$, wherein x , p and q have the meanings cited above; or

A if E is $COOH$ or SO_3H , is $-C_xH_{2x}-$, $-CH_2-S-CH_2-$ or $-CH_2-S-CH_2CH_2-$, wherein x has the meaning cited above; or

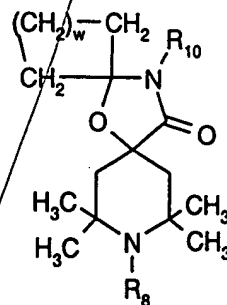
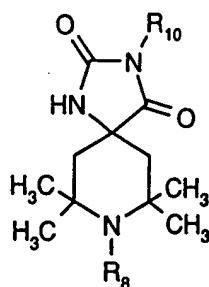
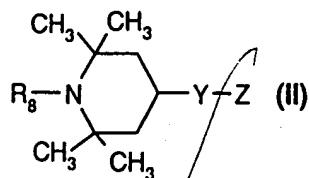
A if E is $-(CH_2)_m-\overset{\text{O}}{\text{CH}}-\text{CH}_2$, is a direct bond, $-C_qH_{2q}-(CO)-O-CH_2-$ or $-C_xH_{2x}-S-CH_2-$, wherein q , m , x , R_1 and R_2 are as defined above;

A if E is $-\overset{\text{O}}{\underset{\text{OH}}{\text{P}}}-R_4$, is $-CH_2-$;

or sterically hindered amines of formula II, IIa or IIb

FOOTNOTES

SUB
B2



SUB B2

R_8 is hydrogen, C_1 - C_{25} alkyl, C_2 - C_{20} alkenyl, C_2 - C_{20} alkynyl, C_1 - C_{20} alkoxy, phenyl- C_1 - C_3 alkyl, C_5 - C_{12} cycloalkyl, C_5 - C_8 cycloalkoxy, phenyl, naphthyl, hydroxyethyl, CO- C_1 - C_{25} alkyl, CO-phenyl, CO-naphthyl, CO-phenyl- C_1 - C_3 alkyl, O-CO- C_1 - C_{20} alkyl or C_1 - C_6 alkyl-S- C_1 - C_6 alkyl, C_1 - C_6 alkyl-O- C_1 - C_6 alkyl,

C_1 - C_6 alkyl-(CO)- C_1 - C_6 alkyl, $-CH_2CH_2-O-CH_2-\overset{\text{O}}{\underset{\text{O}}{\text{CH}}}-CH_2$ or $-CH_2-\overset{\text{O}}{\underset{\text{O}}{\text{CH}}}-CH_2$;

w is a number from 1 to 10;

Y is a single bond, C_1 - C_{25} alkylene, phenylene, biphenylene, naphthylene,

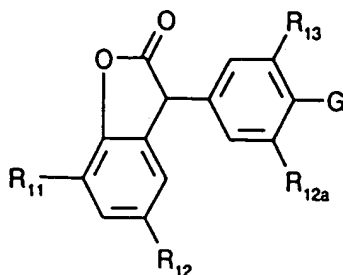
$-O-C_1-C_{25}$ alkylene, $-NR_9-$, $-O-$ or $\begin{matrix} R_9-C=O \\ | \\ -N-C_1-C_{25} \end{matrix}$ alkylene ;

Z is hydrogen, $-COOR_9$, $-NH_2$, $-OR_9$, hydroxyethyl, $-CH_2-\overset{\text{O}}{\underset{\text{O}}{\text{CH}}}-CH_2$ or $-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}=CH_2$;

R_9 is hydrogen or C_1 - C_{12} alkyl;

R_{10} has the same definition as R_8 ;

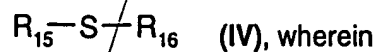
or lactones of formula III



R_{11} , R_{12} , R_{12a} and R_{13} are each independently of one another hydrogen, C_1 - C_{25} alkyl,

phenyl-C₁-C₃alkyl, C₅-C₁₂cycloalkyl or phenyl; and

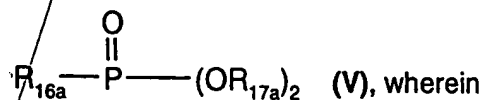
G is OH, OCH₂CH₂OH, $-\text{CH}_2-\text{CH}(\text{O})-\text{CH}_2-$ or -OCH₂COOH;
or sulfides of formula IV



R₁₅ is C₁-C₁₈alkyl, benzyl, phenyl or $-\text{P}(=\text{S})(\text{OR}_{17})_2$; and

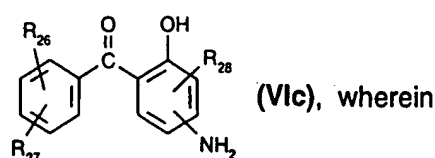
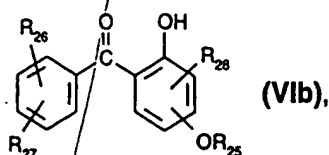
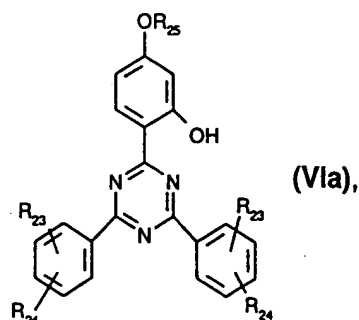
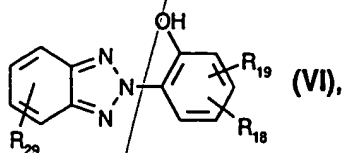
R₁₆ is -CH₂CH₂OH, $-\text{CH}_2-\text{CH}(\text{O})-\text{CH}_2-$, -CH₂COOH or -CH₂CH₂COOH; and

R₁₇ is C₁-C₁₈alkyl or unsubstituted or C₁-C₄alkyl-substituted phenyl;
or phosphites of formula V



R_{16a} is -CH₂CH₂OH or -CH₂CH₂COOH; and

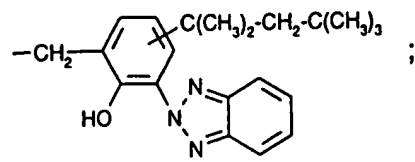
R_{17a} is C₁-C₁₈alkyl or unsubstituted or C₁-C₄alkyl-substituted phenyl;
or benzotriazoles, benzophenones or 2,4,6-triaryl-1,3,5-triazines of formula VI, VIa, VIb or VIc

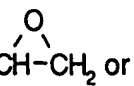


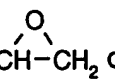
R₁₈ is -(CH₂)₁-R₂₀, $-\text{O}-\text{CH}_2-\text{CH}(\text{O})-\text{CH}_2-$ or NH₂;

1003543-140901

SUB
B2

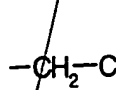
R₁₉ is C₁-C₁₂alkyl, α,α-dimethylbenzyl or a radical  ;

R₂₀ is -OH, -SH, -NHR₃₀, -SO₃H, -COOR₂₁, -CH=CH₂,  or
-(CO)-NH-(CH₂)_u-NCO;

R₂₁ is hydrogen,  or -CH₂-CH(OH)-CH₂-O-(CO)-R₂₂;

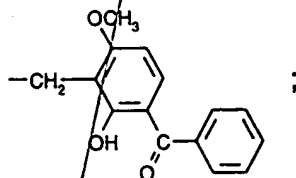
R₂₂ is C₁-C₄alkyl or phenyl;

R₂₃ and **R₂₄** are each independently of the other hydrogen or C₁-C₄alkyl;

R₂₅ is hydrogen, -(CH₂)_u-OH, , -(CH₂)_uCOOH or -(CO)-NH-(CH₂)_u-NCO;

R₂₆ is hydrogen, OH or C₁-C₁₂alkoxy;

R₂₇ is hydrogen or OH;

R₂₈ is hydrogen or  ;

R₂₉ is hydrogen or halogen;

R₃₀ is hydrogen or C₁-C₆alkyl;

m is 0 or 1;

t is a number from 0 to 6;

u is a number from 2 to 12;

with a compatibiliser compound.

17. Use of compounds according to claim 16 as stabilisers and at the same time as phase compatibilisers in plastics or plastic compositions.

10994-452E001

SUB
B2